

April 2017

NSSC This Month

U.S. Army Natick Public Affairs Office



Hill

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its

Fill

**Combat Feeding
visits Congress**

NAGC

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Commander's Corner

Brig. Gen. Anthony W. Potts
NSSC Senior Commander



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NSSC This Month

Word Has Spread

Spring is finally upon us! It seems like a good time to refresh my thanks for your service to our nation and the work you do to unburden, empower and protect our Soldiers. Your dedication is appreciated not only by the leadership at the Natick Soldier Systems Center, but by senior leaders across our Army. Word of your contributions and your reputation has spread throughout the entire military community.



This month, we conducted the inaugural Natick Sexual Harassment and Assault Response Program (SHARP) Expo at the Lord Community Center; by all accounts, it was a resounding success. The tight partnership between our unit victim advocates and partners from RDECOM, the Massachusetts National Guard and Hanscom Air Force Base provided a refreshing approach to training our workforce to prevent, and if needed respond to, sexual misconduct. My sincere thanks to all who contributed.

We also hosted Ms. Sasha Baker, the national security adviser to Sen. Elizabeth Warren of Massachusetts. Senator Warren is now serving on the Senate Armed Services Committee. This was an excellent opportunity to demonstrate what we do at Natick on behalf of the Soldier to a stakeholder outside the Army. Thank you to everyone who played a role in this successful visit – we have several more opportunities in the coming weeks.

With Memorial Day on the horizon, please take a moment and remember those who serve, those who have served, and those who made the ultimate sacrifice. It is because of these people that we enjoy the freedoms we have today. Know that your efforts every day help to bring both today's and tomorrow's Soldiers back home.

TEAM NATICK!



Brig. Gen. Anthony W. Potts
NSSC Senior Commander

NSSC This Month

NSSC
Senior Commander
[Brig. Gen. Anthony W. Potts](#)

Garrison Commander
[Lt. Col. Ryan Raymond](#)

Command Sergeant Major
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About this newsletter
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To subscribe to *NSSC This Month*, please contact Bob Reinert at robert.j.reinert.civ@mail.mil.

On the Web: www.army.mil/natick

Cover photo: Architect of the Capitol



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NSSC News Briefs ...

AAP IHM Observance

May is [Asian American Pacific Islander Heritage Month](#). People of Asian American Pacific Islander heritage have made invaluable contributions, making America a better place in the process. Come learn about this culturally and linguistically diverse group at our Asian American Pacific Islander Heritage Month presentation on May 10 from 10 to 11 a.m. in Hunter Auditorium. The guest speaker will be Mr. [Jyuji D. Hewitt](#) (SES, retired), executive deputy to the commanding general, U.S. Army Research, Development and Engineering Command. The event will also have a slide show, a fun video presentation, and a dance performance by Wah Lum Academy performance team. The program is hosted by NSRDEC, and all NSSC employees are welcome. As an hour-long program, we are privileged to provide just a small glimpse into the achievements, contributions and rich cultures of this widely diverse heritage. Also, on May 10, stop by Lessing's cafeteria and enjoy an Asian-themed lunch menu.

Spring/Summer Safety Day

This season's Safety Day will feature First Aid/CPR Certification Training on Monday, May 22. It will be five to six hours of training with a lunch break. Each directorate is responsible for funding their employees' training. If you are interested, or would like more details, please contact your organization's safety committee member, call ext. 4552, or e-mail lavern.a.olmstead.civ@mail.mil.

Federal Resume Writing

Don't miss our Federal Resume Writing Workshop, which will take place on Tuesday, May 23 from 8:30 a.m. to 12 p.m. in Hunter Auditorium (Bldg. 1). Improve the odds of getting the federal job you want by learning federal resume writing skills and more. Learn about free tools and services, how to find job openings, and how to identify key parts of a vacancy announcement. The course is taught by Certified Federal Career Coach Dan Mazzuca. To register for this event, send an e-mail to stephen.e.berry2.civ@mail.mil with your name, organization, phone number and preferred e-mail address.

MWR Closure

The Lord Community Activities Center (Bldg. 32) will be undergoing scheduled renovation work this spring and is expected to be closed from May 1 through July 4. For more information, please contact MWR at ext. 4791.



Garrison Spotlight

Diane Magrane

What Diane does:

"I currently serve as the Army Community Service program manager for Relocation, Financial Readiness, Army Emergency Relief, Information & Referral, and general ACS inquiries."

ACS Director Kari Sharpe on Diane:

"Diane Magrane is one of the first people that Soldiers and civilians meet when arriving to NSSC. As the Relocation Readiness Program manager, Diane has information, resources and knowledge acquired from years of assisting transitioning families. Of equal importance are Diane's Financial Readiness and Army Emergency Relief efforts. Soldiers looking for emergency financial support, civilians planning for their children's education, or family members looking to improve credit scores can all count on Diane to help or know who can. But Diane's knowledge far exceeds these program areas. If there is any support you or your family desire, chances are Diane knows who can help!"



Photo: Tezanyia L. Mouton, USAG Natick Public Affairs

Barbershop Open

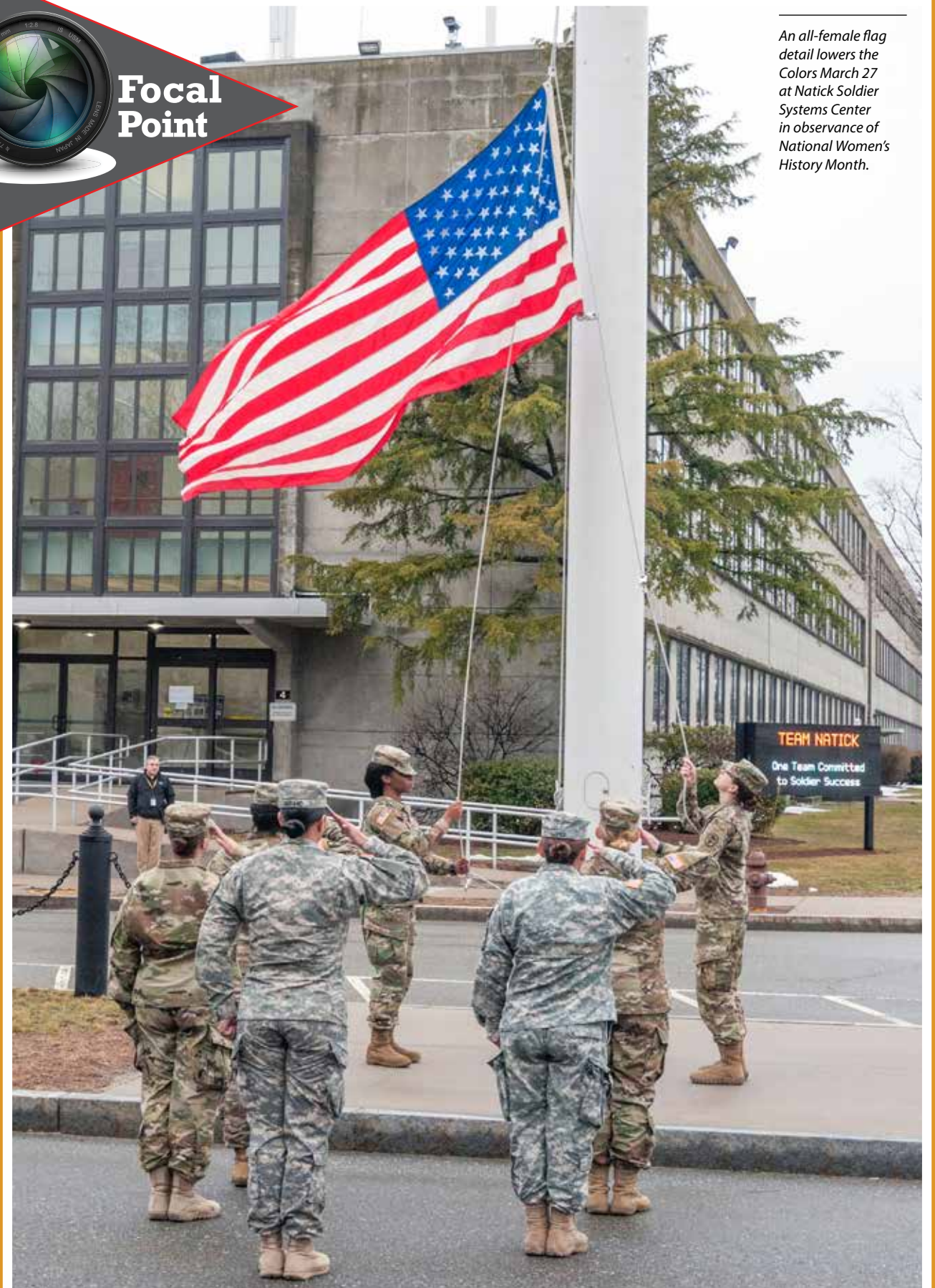
The AAFES Barbershop located on the ground floor of Carney Hall (Bldg. 1) is now open. Team Natick welcomes superb stylist Tita to the barber chair. The barbershop is open for business from 10 a.m. to 3 p.m. on Mondays and Tuesdays and offers a convenient service for civilian and military patrons alike. Patrons may pay in cash or with an AAFES gift card. The better we support our services, the more likely we are to keep them!

Safety Tip

There is a steady increase of pedestrians, runners, bicyclists and motorcyclists on the road now. If you are one of them, make sure to wear reflective clothing and be aware of your surroundings. If you are a driver, be alert at crosswalks and look for any color, movement or sign of them.



Focal Point



An all-female flag detail lowers the Colors March 27 at Natick Soldier Systems Center in observance of National Women's History Month.

Photo: Rich Walunas, NSRDEC Strategic Communications

Natick Soldier Systems Center, or NSSC, got a little more crowded on April 12, with approximately 50 interns from numerous programs throughout the local Boston area entering the gates to attend this year's Dietetic Intern Day.

The annual event, hosted by the [U.S. Army Research Institute of Environmental Medicine's Military Nutrition Division](#), or USARIEM MND, and the Combat Feeding Directorate from the U.S. Army [Natick Soldier Research, Development and Engineering Center](#), or NSRDEC, is a unique opportunity for these future dietitians to meet and connect with dietitians, researchers and Soldiers involved in top-notch Army nutritional science designed to optimize Soldier readiness.

Adrienne Hatch and Nicholes Armstrong, two USARIEM research dietitians who also completed dietetic internships as part of their education and training, enjoy coordinating Dietetic Intern Day. In the past they have attended or assisted with the event, and this is their second year as organizers. For them, Dietetic Intern Day is a chance for interns to get a taste of the unique career paths for dietitians in military medicine and Army research.

"The interns have the opportunity to not only learn about military nutrition and what kinds of studies occur, but also the uniqueness of working as a research dietitian, both in human performance and ration development," Hatch said. "It's an educational opportunity for interns to get a feel for what other jobs in the field of nutrition and dietetics exist, aside from those they may be familiar with through their internship."

"This is also a chance to showcase our collective research abilities at USARIEM, while simultaneously having an opportunity to shape future nutrition experts, since we are geographically located at the epicenter of the nutrition education field," Armstrong said.

The interns learned about the research being done to quantify the unique nutritional requirements of warfighters, build and improve military rations, and encourage healthy eating behaviors. Later, they took a guided tour to meet various USARIEM and NSRDEC researchers. Nutrition research is not unique to the field, but it's the military relevance of the nutrition research mission that sets NSSC



Welcoming the Future

USARIEM hosts dietetic interns from Boston area

By Mallory Roussel, USARIEM Public Affairs/NATICK, Mass. (April 14, 2017)

and USARIEM apart from research in the academic and clinical communities.

"There is a lot of science and applied nutrition that is unique to the military – warfighters have unique stressors and nutritional needs, and because of that, it is a specialized area of nutrition research," Hatch said.

"Hopefully, this will be an eye-opening experience, and some of the interns will be motivated to become military research dietitians," Armstrong said. "This event fosters professional connections that have led to interns completing a portion of their required rotation hours at USARIEM, and in some cases those interns have become future researchers."

USARIEM offers many opportunities to people with different levels of education and skillsets to contribute as team members to USARIEM's mission. One of those

opportunities is the [Oak Ridge Institute for Science and Education](#), or ORISE, program, which offers internships, fellowships and research opportunities to undergraduate and graduate students, recent graduates and postdocs to help further their careers in science fields.

Events such as Dietetic Intern Day help grow the talented workforce that positively contributes to our warfighters' strength and resilience. Perhaps one of the interns who toured NSSC could be a future USARIEM scientist or research dietitian.

"Education and awareness about USARIEM are important – we want to continue to lead the way in Soldier health and readiness, and in order to do that, educating the future workforce who may have a career interest in military nutrition and research is necessary," Hatch said.



Coin Toss?

Beware when handing out the hardware

By Capt. Briana S. Tellado, NSSC Command Judge Advocate

As employees of the military, our operations are funded by tax dollars. After [Congress](#) decides on our fiscal year budget, the money set aside for military spending is referred to as “appropriated funds” or APF.

Congress also publishes instructions for spending those APF, called the [National Defense Authorization Act](#), or NDAA. The NDAA separates the military’s fiscal year budget into various different pots of money. There are different pots of money identified for funding specific items such as procurement, military construction, shipbuilding, research, personnel, and operations and maintenance. Most military expenses that do not have a specific pot of money must be funded by operations and maintenance, commonly referred to as “O&M” or “OMA” (operations and maintenance, Army) funds.

OMA funds pay for the day-to-day business expenses of keeping the military operational. They are used to buy the electricity in our buildings, the paper in our printers, and to pay contractors for regularly recurring services, such as cleaning our office buildings and removing snow. OMA also pays for military awards, such as the Army Achievement Medal or Army Commendation Medal. When a commander awards one of these medals to a Soldier, the commander does not go to the uniform shop and reach into his or her own pocket to buy the medal. Instead, he or she spends OMA, because Congress has decided that military awards are a bona fide need for military operations.

Like military medals, commander’s coins, sometimes called challenge coins, are recognized as a legitimate military

expense. The Army uses coins as small awards given to Soldiers or DA civilian employees to recognize excellence or outstanding performance. They are achievement awards, albeit much faster and easier to award than a military medal. They often have an inscription of “For Excellence” or “In Recognition of Outstanding Performance.”



But don’t be fooled. Just because military coins are small and easy to hand out, that does not mean they are exempt from Congress’ spending rules. Just as it would be improper for a commander to use OMA to buy an Army Achievement Medal and give it to a civilian friend who stopped by the office to say hello, it is equally improper for a commander to give a commander’s coin purchased with OMA to someone who is not eligible to receive an award for exemplary service to the Army.

Unfortunately, commander’s coins have become so ubiquitous that they are not always treated like awards. Instead, they are used as mementos to give to non-military visitors as a sign of good will

or because the commander wants to be well-liked.

For commanders at the general officer or admiral level, there is an additional pot of money set aside for buying small gifts or nice dinners for high-ranking dignitaries or foreign officials. This pot of money is referred to as Official Representation Funds, or ORF. It is used under the auspices of the protocol office and serves to improve or maintain the status of the United States military in the eyes of foreign nationals.

When a high-ranking officer gives a coin to someone who does not work for the [Department of Defense](#), it’s probably an ORF coin. ORF coins will not have an inscription like a normal commander’s coin to recognize performance. Instead, they will often portray unique themes associated with the U.S., the military component, or the command, or depict an event significant to the American commander or a particular event with the high-ranking visitor.

What if you are not a high level commander, but you still want to hand out cool-looking Army trinkets so that people will like you? Or what if you want to thank someone for doing something nice for your unit, such as a military spouse or a volunteer group of Boy Scouts?

In that case, there is no pot of money to purchase such gifts. This commander will have to use OWN funds – meaning he or she will reach into his or her own wallet and use the money inside to buy coins, trinkets, or gifts to give to anybody they want to. To do otherwise would violate the spending rules that Congress has given us, and it is a criminal offense.



Photo: Seymon Kaczmarski/Shutterstock.com

Barbed wire at Auschwitz, Poland, Feb. 23, 2017. Opposite: C. Peter R. Gossels speaks at NSSC.



NSSC

‘Evil Is Nothing New’

Remembering the Holocaust at NSSC

By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (April 25, 2017)

Though he lost family members and was displaced from his home in his childhood, C. Peter R. Gossels refused to let evil control the rest of his life.

Five in his family, including his mother, died in the [Holocaust](#) during [World War II](#), and he and his brother, Werner, escaped to France when they were 8 and 5 years old, respectively, but those personal tragedies never consumed Gossels, now 86.

“Instead of allowing the evil that the Nazis had inflicted on my family to poison my life, by filling my mind with hate for the German people who created and supported [Hitler](#) and his Nazi Party,” said Gossels, “I thought I had more constructive things to do.”

Indeed, Gossels went on to become an accomplished attorney, scholar, public servant and community leader. The Wayland, Massachusetts, resident came to [Natick Soldier Systems Center](#) April 24 to speak at its Holocaust Days of Remembrance observance, “Learning from the Holocaust, the Strength of the Human Spirit.” Also attending the event were a number of invited guests, including his brother, Holocaust survivors, World War II veterans and prominent local community members.

Later in the day, the documentary film, “[The Children of Chabannes](#),” was aired for the NSSC workforce. The 93-minute, Emmy Award-winning film, directed by Gossels’ daughter, Lisa Gossels, deals with the citizens of Chabannes, France, who risked their lives protecting 400 vulnerable Jewish children during World War II.

Born in Berlin in 1930, Gossels was sent from Germany with his brother by their mother in 1939. After a two-year stay in

France, they made their way to the United States in 1941, settling in the Boston area.

“In 1941, my 67-year-old grandfather ... was forced into a train bound for Riga, Latvia,” Gossels recalled. “He was murdered by firing squad along with many other German Jews.”

He also told how his cousin, grandmother and aunt had died at the hands of the Nazis.

“Then on March 2nd, 1943, my 39-year-old mother, who had worked so hard to save the lives of her children, was forced onto a train bound for [Auschwitz](#), Poland, where she was murdered shortly after her arrival,” Gossels said.

Why was he telling those sad stories?

“Evil is nothing new,” said Gossels, adding that “we cannot fully understand the reality of evil until it becomes personal. How do we live with the knowledge that evil exists in many forms and is likely to persist in this world until the Messiah comes, as we Jews are apt to say?”

Gossels, who served in the U.S. Army from 1954 to 1956, recommended supporting the armed forces and first responders.

“The second thing you must do as individuals is contribute to good government,” said Gossels, “to support private organizations dedicated to helping people of



Photo: David Kamm, NSRDEC Strategic Communications

limited means and to helping friends and neighbors in need of help and love.”

Gossels pointed out that though he was “cursed by evil as a child,” he was blessed as an adult by his wife, Nancy Lee Gossels, their three children, and a recent grandchild. Despite what he has been through and all the turmoil in today’s world, Gossels remains hopeful for the future.

“Look at this room,” Gossels said. “This a roomful of good people. Good people will always stand up, I hope, for goodness and decency toward other people, and not just Jews.

“I would think that the majority of people in this country and all over the world, hopefully, will rise up again. We all have to keep fighting evil. It’s going to continue.”



Background photo: Japanese Zen stones in water.



Do You Mind?

Author speaks on mindfulness at Natick

By John Harlow, USAG Natick Public Affairs/NATICK, Mass. (April 27, 2017)

Brewer spent six years working with the VA to help veterans understand their behaviors and habits (mainly addictions) and help them overcome them.



Judson Brewer

Mindfulness is a mental state achieved by focusing one's awareness on the present moment, while calmly acknowledging and accepting one's feelings, thoughts and bodily sensations, used as a therapeutic technique.

[Dr. Judson Brewer](#) spoke to a full house at the Grant Conference Center about mindfulness and how using this technique can improve the way you live.

He started his talk with concepts to examine.

- How Facebook is like crack cocaine
- How [Lolo Jones](#) could have won the Olympic gold medal

Brewer explained reward-based learning. There is a trigger that causes a behavior and brings a reward. Because of reward-based behavior, people are exhibiting all kinds of irrational behaviors that we think are rewarding but turn into consequences that turn into dangerous behaviors, such as driving while texting or falling into a fountain.

Brewer spent six years working with the VA to help veterans understand their behaviors and habits (mainly addictions) and help them overcome them.

How Facebook is like crack cocaine

Brewer showed a photo of two girls at the Louvre in Paris taking a selfie of themselves. While noting that *Time Magazine* named the selfie stick one of the top 25 inventions of 2015, he looked at it as the apocalypse. The girls posted the photo on Facebook, and the rest of the time they were in the museum, one wondered if they were admiring the art or checking the amount of likes they received on Facebook.

Harvard conducted a study in which they put people in an MRI and studied their brains while they thought of the answer to two questions: Do you want to make money, or do you want to talk about yourself?

Most decided to talk about themselves, and when they did, they activated a portion of the brain called the nucleus accumbens. This is the same region of the brain that gets activated when one abuses any drug, including Facebook. It shows that in the brain there is something rewarding about talking about oneself.

In a second study, they can predict the amount of time someone spends on Facebook by the amount of time that the nucleus accumbens are activated.

Brain scans have indicated that the person feels rewarded with each "like" on social media.

Researchers call this "Facebook addiction disorder." For example, if one is in a cubicle on a rainy Tuesday, the brain may wish to look at Facebook pictures because it has learned that it makes one feel good. People go online to regulate their moods where they think it makes them feel better, but it leads to negative outcomes. There is a linear link between social media use and the odds ratio of depression.

How does it work?

The mind interprets triggers as pleasant or unpleasant. When they are pleasant, one wants that to continue. When it is unpleasant, one wants to make it go away as quickly as possible. People behave accordingly, it creates a memory, and they come to be identified with certain behaviors.

If they know how the process works, people can start to affect it. Brewer used smoking as an example.

When smokers quit, they gain an average of 15 pounds, and that is the number one reason that stops women from quitting. They are more afraid of weight gain than getting cancer down the road. This is explained in what is called "behavioral economics," where it is much harder to see something in the future as rewarding as it is seeing the reward right now.

How Lolo Jones could have won the Olympic gold medal

This is an example of how the brain can work against someone. Lolo Jones was an Olympic hurdler for the [U.S. Women's Track and Field](#) team and was favored to win the gold medal in the 2008 [Beijing Olympics](#).

She was in the finals leading with two hurdles to go and clipped a hurdle and fell. She spoke to *Time Magazine* about the race.

"I was in an amazing rhythm," said Jones. "I knew at one point I was winning the race. It wasn't like I was thinking I was going to win the Olympic gold medal; it just seemed like another race. Then I was telling myself to make sure my legs were snapping. That is when I overtried and hit the hurdle."

Brewer stated in his talk: "Instead of doing what she had trained herself to do, which was just run, she got in her own way."

In Brewer's thinking, the critical piece isn't that she had thoughts in her head, it was when she got caught up in her thinking.

Brewer came to Natick as part of the monthly mindfulness program that is offered through [Army Community Services](#).

"Mindfulness programs began at NSSC with the weekly meditation group," said Kari Sharpe, ACS director. "It was so well-received, interest was expressed about mindfulness as a concept. Ellen Merrill suggested that the Center for Mindfulness may have some programming suitable and of interest to the NSSC workforce."

"ACS was able to bring the 'Mindfulness @ Work' program to NSSC, and the interest continued to grow. We were thrilled when Dr. Brewer agreed to come speak about the science and underlying research related to mindfulness."

Hill gets its Fill

Combat Feeding visits Congress

By Cherish T. Gilmore, AMC Public Affairs/WASHINGTON (March 30, 2017)

These are not like the MREs I had to eat, said one of nearly a dozen congressional members who stopped by the combat feeding technology demonstration on Capitol Hill.

Army Materiel Command's [Natick Soldier Research, Development and Engineering Center](#), under U.S. Army Research, Development and Engineering Command, hosted the event for congressional members, staff and visitors in the foyer of the [Rayburn Building](#), March 28.

The demonstration allowed onlookers to speak directly with scientists and engineers, learn about advancements in food processing and sample the latest prototypes in combat rations.

Maj. Gen. Cedric T. Wins, RDECOM commanding general, opened the display with comments about RDECOM and its more than 10,000 researchers, scientists and engineers dedicated to Army innovation on a variety of platforms. Wins emphasized that the day's focus was on Army Materiel Command's number one customer: the warfighter.

"Often, we think a lot about our major weapon systems, but sometimes we forget that our Soldiers are our main weapon system," said [Brig. Gen. Anthony W. Potts](#), deputy commanding general of RDECOM and senior commander of [Natick Soldier Systems Center](#). "Getting him the right nutrition and when he needs it is key."

Food plays a large role in how far and how fast a warfighter can go on the battlefield. The Combat Feeding Directorate, led by Stephen Moody, uses leading-edge technologies to ensure the warfighter has the decisive edge in all aspects of combat feeding.

And not only is nutrition important, but taste is, as well, explained Potts.

"A few years ago, we started a Soldiers' jury to taste test and provide feedback," said Potts. "With feedback, we are trying to generate the taste with the right amount of nutrition and supplements the Soldier needs to enhance the performance while they are out in the field."

Between 200 and 400 Soldiers or Marines are called upon to rate existing rations and test rations.

"Every year we design new ration components, along with industry submissions, and we incorporate them into test rations," said Moody. "When test rations are rated very high, we take the lower-rated ration components and change those out. In any given year, we are changing out three to a half-a-dozen components. This keeps the variety high and the acceptability high among Soldiers."



Congressman Ted Yoho samples some of the latest Army provisions at the Combat Rations Feeding Demonstration March 28 on Capitol Hill.

Between 80 and 90 scientists and engineers work in the Combat Feeding section at Natick, under the direction of Moody.

"They are all really passionate about what they do, and that really comes through in a setting like this," said Moody. "The passion helps when we are engaging with the public, leaders in Congress or leaders in DoD to help them see there is a lot of science behind this. Everybody cooks and everyone eats, but when they see the science it takes to make something last for three years at room temperature and still taste good, they are really impressed."

The demonstration remained open for nearly three hours with hundreds of visitors, staffers and liaisons sampling the latest combat rations. On display for sampling were the mocha flavored para-trooper bar, chocolate flavored performance readiness bar, omega 3 lemon poppy seed pound cake, coconut flavored agglomerated hula bar, jalapeno nut meal replacement bar, optimized instant beverage, chicken burrito bowls, teriyaki beef sticks, beef stew, and first strike sandwiches. Nutritional information for each fielded item is located at <http://hprc-online.org/comrad>.

"What a great opportunity for us to work with our members of Congress today," said Potts. "It's always better if you can touch it, taste it and feel it – then you will remember it better than if I just bring you in for a PowerPoint presentation."

Heating Up

USARIEM seeks to help warfighters keep their cool

By Mallory Roussel, USARIEM Public Affairs/NATICK, Mass. (April 24, 2017)

Temperatures are rising, and with warfighters operating in hot and humid conditions while wearing protective clothing or performing intense work, research to prevent heat illness from diminishing warfighter performance and posing significant health risks is on the rise, as well.

The military has long needed a non-invasive monitoring device that can track warfighters' physiological health during field operations and training. In this technological age when mission leaders and medics need to know the health status of their troops to make quick decisions, real-time guidance on heat illness prevention is more important than ever.

The Estimated Core Temperature, or ECTemp, algorithm, developed by Dr. Mark Buller at the [U.S. Army Research Institute of Environmental Medicine](#), helps fulfill that need. The ECTemp algorithm provides accurate estimates of core body temperature simply by analyzing heart rate changes over time, allowing mission leaders to detect if a Soldier is at increased risk of heat illness.

The [U.S. Army Medical Research and Materiel Command](#), or USAMRMC, non-exclusively licensed the ECTemp algorithm to Zephyr Technology a few years ago to use as one of the features of its Bioharness. The Bioharness system will be used to monitor team member health statuses to prevent and mitigate the risk of heat illness or injury.

According to a study the [Air Force Research Laboratory](#), or AFRL, conducted, the algorithm has proven to be successful in real-world scenarios.

"Currently, the [Altman Systems Directorate](#) and the 350th Training Squadron have been working together to utilize the Zephyr system, equipped with the ECTemp algorithm, to monitor trainees," said, Dr. Craig Murdock, the principal investigator of the AFRL study. "Using the ECTemp has helped them identify and mitigate over 30 cases of heat stress and prevented more serious heat stress casualty situations."

According to Buller, a research physiologist from USARIEM's [Biophysics and Biomedical Modeling Division](#), the algorithm "uses mathematics from tracking problems to determine core temperature from heart rate observations, and it is based on years of physiological data from multiple studies.

"The algorithm assumes heart rate can be used as a 'noisy' observation of core body temperature. Physiologically, heart rate reflects both the blood flow to the muscles and the rate of blood flow to the skin, containing information about both heat production and heat loss from the body.

"The ECTemp algorithm provides a practical approach to monitoring warfighters' physiology in the least invasive way. You can get a very accurate assessment of core body temperature from a warfighter wearing a simple, chest-worn heart rate monitor."

Medical practitioners and researchers have used a variety of methods to record core body temperature, from oral, to rectal, to ear and more, all with varied results. USARIEM also uses swallowable thermometer pills in research studies to get an accurate reading of a warfighter's internal body temperature. Yet thermometer pills are also expensive, and they are best used as a research tool rather than as a monitoring device in training and battlefield scenarios.

In terms of accuracy, how does the ECTemp algorithm measure up?

"The ECTemp algorithm has now been tested on over 300 individual warfighters in the laboratory, during training and while deployed on missions," Buller said. "When you compare these ECTemp data to an ingestible thermometer pill, it performs as well as when you compare the thermometer pill to a rectal or esophageal probe."

Any healthy person's temperature can change slightly by a few degrees throughout the day, depending on different climates and circumstances. Body temperature declines during sleep, which reflects a normal circadian rhythm, or body clock, that determines when we need to be asleep or awake. USARIEM researchers have been able to detect even these slight temperature changes during overnight studies.

"In overnight studies in our metabolic chambers, our findings suggest the ECTemp algorithm can extract circadian rhythms from resting individuals," Buller said.

With proven accuracy in estimating warfighters' core body temperatures, the algorithm has opened the door to future monitoring apps and wearable technology for the military.

"By getting the basic science right, USARIEM provides the basis of the tools the AFRL and other individual units can use to meet their needs," Buller said.

Military leaders can use the algorithm to adjust missions in hot, humid and unpredictable environments, according to Buller. The ECTemp algorithm, by providing accurate core temperature information, can help leaders make timely, critical training and mission decisions.

"The technology, which USARIEM and the AFRL has provided and which the Battlefield Airman training utilizes, mitigates thermal injuries, keeping students in training rather than failing due to performance decrements or being medically removed," said Lt. Col. Stephen Savell, 350th Training Squadron commander.

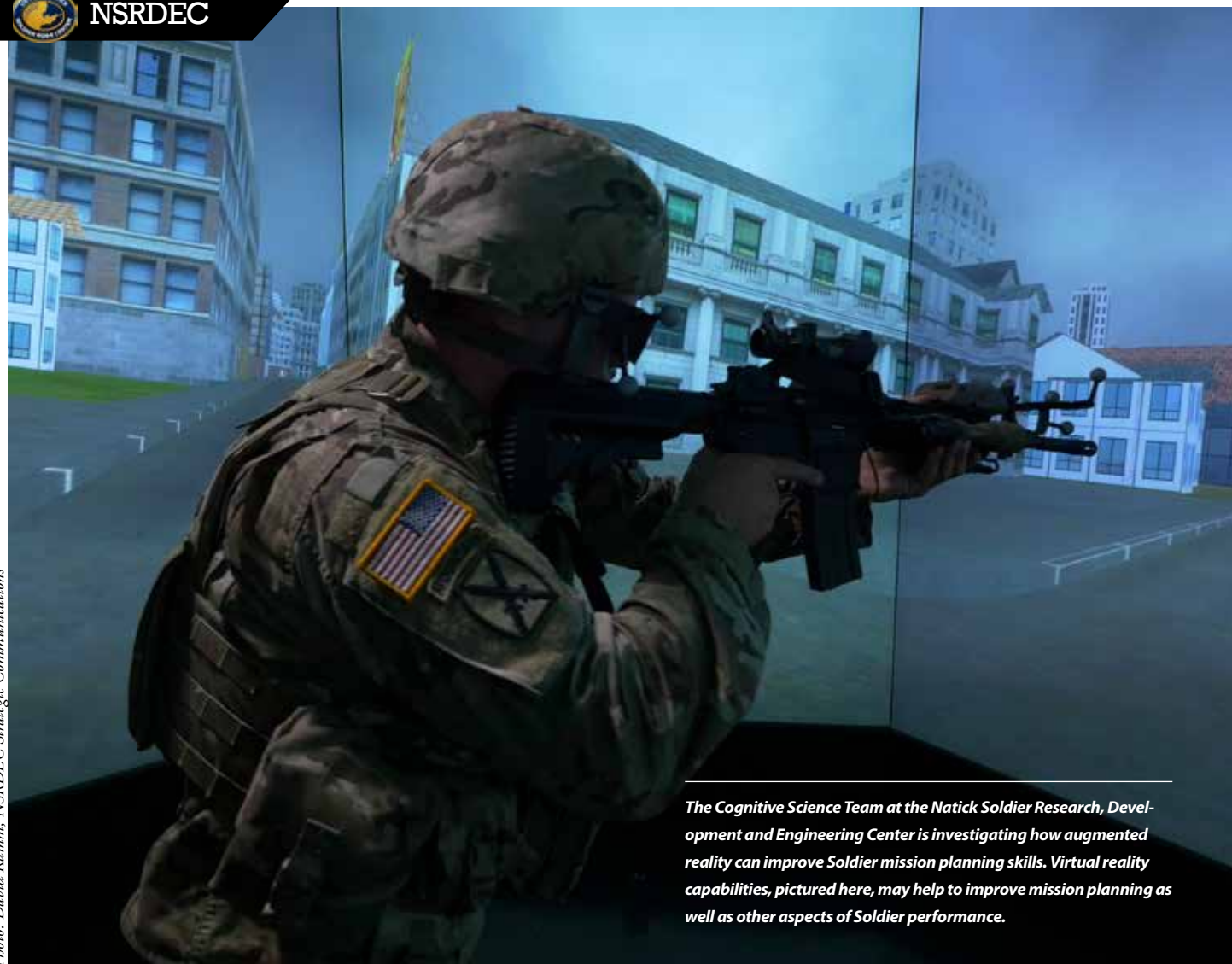
Echoing this viewpoint, Buller noted, "We want warfighters to work hard, but we also want them to complete their missions and training safely. The ECTemp algorithm provides objective information to military leaders and medics so they can make the best decisions for the mission."



Photo: U.S. Air Force

"Warfighters will go through hard training that can cause their body temperatures to increase. The ECTemp algorithm can provide mission leaders the situational awareness on who is getting hot and who should not be getting hot."

Dr. Mark Buller, USARIEM



The Cognitive Science Team at the Natick Soldier Research, Development and Engineering Center is investigating how augmented reality can improve Soldier mission planning skills. Virtual reality capabilities, pictured here, may help to improve mission planning as well as other aspects of Soldier performance.

Keeping It Real

Natick scientists investigating augmented reality as a mission planning tool

By Jane Benson, NSRDEC Public Affairs/NATICK, Mass. (April 6, 2017)

Members of the Cognitive Science Team at the [Natick Soldier Research, Development and Engineering Center](#), or NSRDEC, are helping Soldiers to keep it real – and then some. The team is investigating how augmented reality, or AR, may help Soldiers improve their mission-planning skills.

“Our goal is to evaluate mobile AR as a promising candidate technology to improve mission-planning operations,” said Aaron Gardony, an NSRDEC research psychologist. “Soldiers are members of a team, but they are also multi-faceted individuals with unique preferences and aptitudes. For example, some may easily visualize three-dimensional environments from two-di-

mensional maps, but others may learn better using 3-D imagery.

“In contrast to the one-size-fits-all approach 2-D representations provide, we believe AR-based mission planning using interactive 3-D maps and models could allow individuals to tailor their planning experience to their own preferences and those of their team members. Doing so could improve cognitive performance at both the individual and group level, leading to improved mission-planning outcomes and, ultimately, enhanced mission effectiveness.”

Currently, mission and route planning is often performed by Soldiers located in the same place using 2-D displays, such as

topographic maps, but improvements in technology have enabled new approaches.

“Recent advances in augmented reality technology have allowed for rich, mobile and multi-user augmented reality experiences,” said Gardony. “Leveraging this nascent technology in our current work, we ask how AR-based interactions with rich 3-D environmental models can improve route learning compared to existing 2-D methods.”

In the ongoing study, participants learn a prescribed route while interacting with a 3-D model of a city. They are able to zoom, pan and rotate their view while memorizing the route, and then they are tasked with walking the route from memory.

Through the research, NSRDEC scientists hope to observe and quantify the physical interactions and strategies Soldiers use during the AR-based city exercise. The study also aims to find out how individual knowledge, skills and abilities may predict the individual’s interactions and strategies, as well as their ability to learn and navigate complex routes.

The study is being performed at the [Center for Applied Brain and Cognitive Sciences](#), or the Center for ABCS. NSRDEC teamed up with [Tufts University School of Engineering](#) to create the center, which brings together experts in neuroscience, psychology, linguistics, computer science and robotics. Through the center, NSRDEC and Tufts University are collaborating to advance researchers’ understanding of how people think, respond and perform in demanding, real-world situations. The center aims to provide insight into how Soldiers think in response to ever more complicated and challenging environments.

“The Center for Applied Brain and Cognitive Sciences seeds rapid multidisciplinary scientific and technological innovation,” said Gardony. “The center’s access to cutting-edge technologies, such as the Microsoft HoloLens and team-level immersive virtual reality, allows NSRDEC scientists to take an integrative and comprehensive approach to Soldier-relevant applied cognitive research. Housed near Tufts’ Medford campus, the center’s location affords us ready access to expert Tufts faculty from diverse disciplines, technical support staff, as well as Boston-area cognitive science researchers, fostering collaboration and interdisciplinary research efforts. This unique combination of innovative technological capabilities, brilliant colleagues, and its location makes CABCS an excellent place to efficiently and effectively pioneer next-generation Soldier-relevant research and technology.”

The augmented reality research could lead to the discovery of ways to optimize Soldier performance.

“Virtual and augmented reality technologies provide realistic simulations of real-world scenarios that have the potential to improve mission performance, operational flexibility and training effectiveness while reducing risk,” said Gardony.

“Augmented reality provides Soldiers and small teams unprecedented access to high fidelity visualizations, affording rapid,

interactive enhancements to situat The Cognitive Science Team at the Natick Soldier Research, Development and Engineering Center is investigating how augmented reality can improve Soldier mission-planning skills. Virtual reality capabilities, pictured here, may help to improve mission planning as well as other aspects of Soldier performance. ion awareness, planning and decision making,” said Dr. Tad Brunyé, a senior research psychologist on NSRDEC’s Cognitive Science Team and scientific manager of Perception, Cognition and Action at the CABCS. “This project demonstrates how the defense science community benefits from leveraging cutting-edge commercial tools to advance the art of the possible in Soldier and small unit performance optimization.”

“This study takes a novel step in evaluating AR for mission planning/route learning,” said Gardony. “Positive results could provide a basis for future fielding of these technologies to improve mission planning and justify future research examining its impacts in other military contexts.”

The networking possibilities made possible through emerging mobile AR platforms could enable multiple users to have collaborative shared experiences, thus enabling Soldiers to do their jobs better.

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“Soldiers could use mobile AR to engage in flexible, on-the-fly mission planning with remote team members,” said Gardony.

“For example, in rapidly evolving combat and non-combat scenarios, leaders could remotely deploy and brief updated mission objectives to Soldiers in the field, engaging in remote collaboration and mission planning using timely 3-D models of exterior and interior spaces.”

Gardony is dedicated to advancing cognitive science, especially when it helps the Soldier.

“Our research does not happen without an in-depth understanding of the contexts and constraints imposed upon Soldiers, and how technological and scientific innovation can improve monitoring, characterizing, predicting and optimizing human cognition and behavior,” said Gardony. “It is highly rewarding to be part of something bigger, to know that the results of our research could improve Soldier effectiveness and well-being. It is also rewarding to interact with Soldiers regularly as part of our research, both as participants in our studies and as providers of key feedback about their experiences and challenges, grounding our scientific outcomes and motivating future research questions.

“Many Soldiers and leaders are excited to participate in and benefit from our research, and see the value in what we do. That motivates us to work even harder for them.”



“The 75-percent recovery rate, that’s huge. That’s the intent of this system, is to reduce those resupply rates, and then the second- and third-order effects of that is pulling people off the roads.”

Capt. Matt Porter, Force Provider

Cleaning Up

PM FSS helps Marines test Shower Water Reuse System

By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (April 25, 2017)

If someone suggested that you reuse the water that someone had just used to shower, you might hesitate, but some 850 [Marines](#) did just that recently in the Arizona desert.

As part of a field exercise at [Yuma Proving Ground](#), members of [Marine Aviation Weapons and Tactics Squadron One](#) tested the Shower Water Reuse System, or SWRS, part of the Army’s “Force Provider” shelter system, over a five-week period. Personnel from [Product Manager Force Sustainment Systems](#), or PM FSS, spent three days at the beginning of the exercise showing members of [Marine Wing Support Squadron 271](#) how to operate the system.

The SWRS captures and reuses 75 percent of gray water, reducing the number of risky resupply convoys necessary to forward operating bases. That saves Soldiers’ lives and millions of dollars.

“The 75-percent recovery rate, that’s huge,” said Capt. Matt Porter, Force Provider assistant product manager. “That’s the intent of this system, is to reduce those resupply rates, and then the second- and third-order effects of that is pulling people off the roads. “We’ve had it in the field ... since like 2007, 2008. It’s been part of the Army Force Provider inventory, but now ... we’re reaching out to different organizations to utilize it a little more.”

Enter the Marines, who currently use the [Tactical Water Purification System](#), or TWPS. This was the Corps’ first experience with the SWRS.

“They’re used to the TWPS, which is already out in the field,” said Ryan Eckert of Force Provider. “A lot of components are

the same for each of them. Now it’s just tied in with the computer. They’ve gone from a lot of manual operation with it to a computer now that does everything ... pretty much for them.

“So far, they like it. They just basically push a button and walk away.”

At Yuma, PM FSS hooked up the SWRS to a 12-head battlefield shower.

“That’s what they use,” said Eckert of the Marines. “It’s not the standard Force Provider shower. (The SWRS connected) to a standard 3,000-gallon water bag, and then the configuration from there was the same.”

As Porter pointed out, the system doesn’t need to be connected directly to a shower.

“It just needs to be hooked up to a source,” Porter said. “You could feasibly pull (water) from any shower source. There are a lot of applications for it. It’s just a matter of putting them out into the field.”

New to the system in recent months is the ability to process and reuse laundry

gray water. According to Porter, software upgrades and changes to rate flow allow the system to handle the lint accumulation typical with laundry.

“It’s the same system, same configuration, transparent to the user,” Porter said. “There’s been no changes to it – just internally, it operates in a little different manner.”

Might there be a future for SWRS with other services, as well?

“We’ll discuss it at the Joint Base Expeditionary Working Group,” Porter said. “That’s kind of the forum to share ideas in contingency basing across the services, obviously. The Army and the Air Force do a lot of the same things with (Basic Expeditionary Airfield Resources) and Force Provider.”



A Marine checks on a Shower Water Reuse System during a recent exercise at Yuma Proving Ground, Ariz.

Photo: Ryan Eckert, PM FSS



Memorial Day
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